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Last Week Stunk

Posted by Pierluigi Oliverio on Monday, October 12, 2009

Last week, I toured the City of San Jose's sanitary sewer system along with Public Works staff. For those of you who may not be aware, sewers in San Jose stretch out for 2,200 miles and range anywhere from 100 years old to brand new. The "sewer freeway" is at Zanker Road, where four large-diameter lines converge towards Alviso. They run side by side in different sizes and during the dry season we turn two of them off since the flow is slower without rainfall. This gives a rest to the other lines so they can be inspected and also helps move solid materials (grit) through the pipes.

Solid debris is made of mostly sand and organic matter (coffee grounds, egg shells, bones), toiletries, to massive clogs of hair the size of a 4th grader. One method to clear the line is to use the "Pig Launcher." This is where a neoprene bullet-shaped cleaning plug is shot down the pipe with a blast of water from a pumping station and then retrieved at the next pumping station.

Replacing sewers pipes is important and is ongoing year-round. Since many of the pipes are small, we use technology to travel down the pipe. For example, we have a robot that cruises down the sewer pipe with a bright light and camera that rotates to view the entire circumference of the pipe. The rotating of the robot allows staff to see a break, root intrusion or large objects.

Digging up and replacing the pipe is a big project that impacts anyone connected to that line. One method that used is a process that blows a tube, (like a long tube sock) into a section of pipe that requires fixing. Hot liquid is then pumped through the liner causing the material, a form of epoxy, to expand. With the liquid removed, the material hardens. Next a robot is maneuvered through the new pipe cutting a tap out at each residence allowing the flow from each household to resume. The pipe diameter becomes a bit smaller—however the pipe is completely smooth with all breaks and cracks repaired.

All cities face the challenge of maintaining sewer infrastructure over time. The items we flush begin to decompose within the sewer mains and can create gases that over time can corrode concrete pipes. Also, trees through root intrusion break the pipes, which is problematic since San Jose loves its tree canopy. So when you see a beautiful tree-lined street it inevitably will create more problems with the sewer lines. It's a dilemma for tree owners as

those roots are thirsty and will break pipes looking for water—not to mention the havoc on sidewalks. Personally I am not prepared to take out my trees, however I will have to budget for future expenses like plumbing and sidewalks because of them.

The largest culprit in blocking of the sewer pipes is "FOG"—fats-oils-grease. Pouring these into your kitchen sink is problematic as it travels from your home to the six inch pipe (typical residential sewer main) on your street where it eventually merges with a larger pipe as it moves north towards Alviso. Homeowners are responsible for the "lateral" pipe from their home to sewer connection. If your pipe clogs up because of "FOG" then the homeowner would have to pay out of pocket to get it fixed.

Personally, I was hoping to get dirty and get down in the sewer and walk around like the people you see on the show "Dirty Jobs" on the Discovery Channel. However, the Occupational Safety and Health Administration (OSHA) rules required that a breathing apparatus be used while the person going down is hooked to a harness. Without the gas mask a person would pass out due to the methane and other gases. Needless to say, the sewer can be stinky, so iron salt is added into a large sewer main near Blossom Hill Road so there is less odor. In addition, a pilot program has been launched allowing hydrogen peroxide to be injected into the sewer mains over by Bay 101 to minimize the smell.

The smell is why we have the buffer lands between the sewage treatment plant and people who live nearby. Over time, we may see development of these buffer lands. For example, this area was where Tesla Motors was proposed to locate in San Jose, however, my mantra is always buyer beware. We also have sheep on the buffer lands so that we don't have to mow it. As I looked at the buffer lands, it reminded me of something out of an African savanna as many sheep were huddled for shade. I did not observe rats or mice in the sewer as I pictured from movies, but there were lots of cockroaches visible when lifting up a manhole cover.

We observed the sewer flowing through the larger pipes called "interceptors," moving at about 8-10 feet per minute which seemed pretty fast. I expected the water to be thicker, however it was actually viscous. San Jose is lucky in the we are fairly flat but we do have a slight decline from South San Jose towards Alviso so fewer pumping stations are needed than in other cities.

Managing sewers for a city our size is a very technical job and one that requires skilled professionals that I would include in the realm of public safety. Finally, visiting the sewers reminds me about the importance of infill development and building within versus building outside of the urban service area.

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